

WHAT IS CLAIMED IS:

1. A positive electrode material for a lithium secondary battery, which is a composite oxide powder having a total composition represented by $\text{Li}_a\text{Ni}_b\text{Co}_c\text{Ba}_d\text{Al}_e\text{O}_x$ where

$$a/(b+c): 1.0 \text{ to } 1.2$$

$$b/(b+c): 0.5 \text{ to } 0.95$$

$$c/(b+c): 0.05 \text{ to } 0.5$$

$$d/(b+c): 0.0005 \text{ to } 0.01$$

$$e/(b+c): 0.01 \text{ to } 0.1$$

$$b+c = 1$$

x: not specified.

2. The positive electrode material for a lithium secondary battery according to claim 1, wherein an amorphous phase of an oxide is dispersed within a particle of the composite oxide powder.

3. The positive electrode material for a lithium secondary battery according to claim 1, wherein the amorphous phase of the oxide is formed on a surface portion of a particle of the composite oxide powder.

4. The positive electrode material for a lithium secondary battery according to claim 1, wherein the amorphous phase of the oxide is dispersed within a particle of the composite oxide powder and also formed at a surface of the particle.

5. The positive electrode material for a lithium secondary battery according to any one of claims 2 to 4, wherein a constituent component of the amorphous phase of the oxide is an oxide of one or a plurality of elements selected from the group consisting of Li, Ba, and Al.

6. The positive electrode material for a lithium secondary battery, which is a composite oxide having a total composition represented by $\text{Li}_a\text{Ni}_b\text{Co}_c\text{Ba}_d\text{Al}_e\text{M}_f\text{O}_x$ where

M: one or a plurality of elements selected from the group consisting of Na, K, Si, B, and P,

$a/(b+c)$: 1.0 to 1.2

$b/(b+c)$: 0.5 to 0.95

$c/(b+c)$: 0.05 to 0.5

$d/(b+c)$: 0.0005 to 0.01

$e/(b+c)$: 0.01 to 0.1

$f/(b+c)$: 0.01 or less (not inclusive of 0)

$b+c = 1$

x: not specified.

7. The positive electrode material for a lithium secondary battery according to claim 6, wherein the composite oxide is a powder, a particle of which has an amorphous phase of an oxide dispersed within the particle.

8. The positive electrode material for a lithium secondary battery according to claim 6, wherein the composite

oxide is a powder, a particle of which has an amorphous phase of an oxide on a surface of the particle.

9. The positive electrode material for a lithium secondary battery according to claim 6, wherein the composite oxide is a powder, a particle of which has an amorphous phase of an oxide dispersed within the particle and also formed on a surface of the particle.

10. A method for producing a positive electrode material for a lithium secondary battery, the method comprising:

adding Ba and Al raw materials to a Li-Ni-Co-O system raw material, whereby consequently obtaining a mixture; and

firing the mixture.

11. A method for producing a positive electrode material for a lithium secondary battery, the method comprising:

adding Ba and Al raw materials and a raw material for forming an amorphous phase of an oxide to a Li-Ni-Co-O system raw material, whereby consequently obtaining a mixture; and

firing the mixture.

12. A method for producing a positive electrode material for a lithium secondary battery, the method comprising:

adding Ba and Al raw materials to a Li-Ni-Co-O system raw material, whereby consequently obtaining a mixture;

firing the mixture;

further mixing a raw material for forming an amorphous

phase of an oxide in the fired mixture, whereby consequently obtaining a further mixture; and

re-firing the further mixture.

13. A method for producing a positive electrode material for a lithium secondary battery, the method comprising:

adding Ba and Al raw materials and a raw material for forming an amorphous phase of an oxide to a Li-Ni-Co-O system raw material, whereby consequently obtaining a mixture;

firing the mixture;

further mixing a raw material for forming an amorphous phase of an oxide in the fired mixture, whereby consequently obtaining a further mixture and

re-firing the further mixture.

14. A lithium secondary battery comprising a positive electrode composed of the positive electrode material for a lithium secondary battery as recited in any one of claims 1 to 9.